

ABSTRACT

An optical transmission network is inherently asynchronous due to the utilization of a variable overhead ratio (V-OHR). The network architecture makes extensive use of OEO regeneration, i.e., deals with any electronic reconditioning to correct for transmission impairments, such as, for example, FEC encoding, decoding and re-encoding, signal reshaping, retiming as well as signal regeneration. The optical transmission network includes a plesiochronous clocking system with intermediate nodes designed to operate asynchronously with a single local frequency clock without complicated network synchronization schemes employing high cost clocking devices such as phase locked loop (PLL) control with crystal oscillators and other expensive system components. The asynchronous network operation provides for asynchronous remapping or remapping of any client signal utilizing any type of transmission protocol where the line side rate or frequency is always the same frequency for the payload signal and the local frequency at an intermediate node is set to a local reference clock in accordance with the payload type and its overhead ratio, i.e., the overhead ratio is varied to meet the desired difference between the line rate or frequency and the desired client signal payload rate or frequency for the particular client signal payload type.